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The impact of COVID-19 on traumatic hand injuries: A Turkish survey

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Abstract
Aim: Our aim in the study is to perform a comparative analysis of traumatic hand injuries during the quarantine period of the COVID-19 pandemic with data of the previous year and to research the effect of quarantine on hand injuries.
Material and Methods: We retrospectively analyzed patients who presented to the emergency department with traumatic hand injuries between 16.03.2020 and 01.06.2020 and within the same period of 2019. Patients' age, gender, injury mechanism, length of hospitalization, ethnic origin, presence of major and digital nerve injuries, presence of bone injury, emergency or elective surgery data were recorded. The data were analyzed statistically in comparison with the previous year.
Results: A total of 301 patients participated in the study. There were 117 patients in 2020, and 184 patients in 2019. When patients of both years were examined in terms of age, gender and length of hospitalization, there was no statistically significant difference between the patients who were operated for hand injuries between 2020 and 2019 ($p>0.05$). When patients who were operated due to hand injuries were examined in terms of differences in ethnic origin, operation under emergency conditions and accompanying bone injury between both groups, a statistically significant difference was found between them ($p<0.05$).
Discussion: A decrease was observed in the number of traumatic hand injuries admitted to the emergency department during the COVID-19 pandemic; however, there were no changes in etiology. These reference data can help healthcare systems prepare for future outbreaks and similar restrictions.

Keywords
Hand; Injury; COVID; Pandemic; Trauma

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Introduction

As it is known, the COVID-19 virus, which emerged in China-Wuhan in December 2019, has spread rapidly all over the world. After this rapidly spreading pandemic, patients with respiratory complaints began to present to hospitals day by day, placing a serious burden on the health system [1]. Even though daily life is restricted during this period, trauma patients continue to present to the hospital. It is also known that hand injuries, in general, constitute about 29% of the injuries treated in hospital, and they represent a considerable percentage [4]. Therefore, emergency and hand surgery departments are constantly dealing with hand injuries. Due to the pandemic, the management of both virus-related and trauma patients has gained significance in this period. Our aim in the study is to investigate the effects of the pandemic and quarantine period on hand injuries by analyzing patients who presented to the hand surgery department in the period since the COVID-19 outbreak compared to the previous year, and to have an idea about what might happen in similar cases in the future.

Considering this situation, the issue of how traumatic hand injuries are managed will be an example for similar cases in the future besides the increasing health system burden [2-3].

Material and Methods

The study was designed retrospectively; the data of patients between 16.03.2020 and 01.06.2020 and the data of patients who had been hospitalized and had traumatic hand injuries within the same period a year ago were examined and analyzed. The digital archive of the hospital was used while obtaining the data. Patients with problems other than hand injuries, conservatively treated patients, and patients who had hand operations due to non-traumatic reasons were excluded from the study. Patients who received inpatient treatment and operated due to hand injuries, according to the hospital registry archive, were included in the study. All patients' age, gender, ethnic origin, injury mechanism, presence of accompanying major nerve injury, presence of accompanying digital nerve injury, presence of accompanying bone injury, whether they were operated in emergency or elective conditions, and duration of hospitalization were recorded. The same data were also recorded within the same date range for the previous year. Differences within each year were statistically analyzed. The study was approved by local ethic committee (decision no:2020/425).

Statistical analysis

In the descriptive statistics of the variables examined in the study, continuous variables (age, length of hospitalization (days)) were expressed as mean ± standard deviation, median (minimum-maximum), and nominal variables as n (%). The statistical significance of nominal variables between two years was tested with the chi-square test, and continuous variables with the Mann-Whitney U test. In all statistical analyses, the significance level was accepted as $p<0.05$, and the IBM SPSS 22.0 (IBM Corp, Armonk, NY, USA) software was used.

Results

A total of 301 patients participated in the study (Table 1). While 263 (87.4%) of the patients who participated in the study were Turkish citizens, 38 (12.6%) were Syrian refugees. According to years, 108 were Turkish citizens and 9 were Syrian citizens in 2020, whereas 155 were Turkish citizens and 29 were Syrian refugees in 2019. Among the injury mechanisms, most of the injuries were caused by accidents resulting from glass incision (Table 2).

When the major nerve injuries accompanying the injuries were analyzed, a total of 258 patients had no accompanying nerve injuries, whereas 43 patients had major ulnar, radial, and median nerve injuries. Median nerve injury was found in 24 patients, ulnar nerve injury in 11 patients, and radial nerve injury in 8 patients. While this number was characterized bynerve injuries in 26 (10 median, 10 ulnar, 6 radial) patients in 2020, major nerve injuries were observed in 17 (9 median, 6 ulnar, 2 radial) patients in 2019. On the other hand, when the digital nerve injuries accompanying the injuries were analyzed, 93 patients had no digital nerve injuries, whereas 24 patients had digital nerve injuries in 2020. In 2019, 163 patients had no digital nerve injuries, whereas 21 patients had digital nerve injuries.

When both groups were analyzed for the presence of accompanying bone injuries, 49 patients had accompanying bone injuries and 68 patients did not in 2020. In 2019, on the other hand, 49 patients had bone injuries, whereas 135 patients

Table 1. Patients, age, gender according to years

	2020	2019	Total
Patients	117 (%38.8)	184 (%61.2)	301
Male	92 (%78.6)	141 (%76.6)	233 (%77.8)
Female	25 (%21.4)	43 (%23.4)	68 (%23.6)
Age	25 (2-65)	27 (1-81)	26.6 (1-81)

Table 2. Patients, age, gender according to years

	Total		2019		2020			
Injury mechanism								
Glass Cut	82	25,60%	45	54,50%	22,80%	37	45,50%	29,90%
Knife Cut	40	11,60%	20	57,10%	10,90%	20	42,90%	12,80%
Other	25	8,30%	16	64,00%	8,70%	9	36,00%	7,70%
Saw Cut	27	9,00%	13	48,10%	7,10%	14	51,90%	12,00%
Gunshot (Close)	14	4,70%	9	64,30%	4,90%	5	35,70%	4,30%
Gunshot (Far)	10	3,30%	7	70,00%	3,80%	3	30,00%	2,60%
Crush	36	12,00%	16	44,40%	8,70%	20	55,60%	17,10%
Motor-Vehicle accident	10	3,30%	6	60,00%	3,30%	4	40,00%	3,40%
Avulsion	9	3,00%	6	66,70%	3,30%	3	33,30%	2,60%
Fall from height	14	4,70%	12	85,70%	6,50%	2	14,30%	1,70%
Reoperation	34	11,30%	34	100,00%	18,50%	0	0,00%	0,00%

Table 3. Patients Demographics and statistical analysis

	2019	2020	p-value
Age	29,1± 15,9	28,7±16,3	0.639
Hospital Stay	1,71±5,1	1,71±5,1	0.323
Gender	141/43	92/25	0.398
Ethnicity	155/29	108/9	0.028
Bone injury	49/135	49/68	0.005
Urgent operation	133/51	93/26	0.001

had no accompanying bone injuries.

Among the patients who participated in the study, 224 were operated under emergency conditions.

Length of hospitalization was analyzed in both groups. The average length of hospitalization was 0 days in both groups. Length of hospitalization varied between 0 and 35 for 2019 and between 0 and 13 for 2020.

When the patients of both years were examined in respect for age, gender and length of hospitalization, there was no statistically significant difference between the patients who were operated for hand injuries between 2020 and 2019 ($p>0.05$) (Table 3).

When the patients operated for hand injuries were examined in respect of differences in ethnic origin, operation under emergency conditions and accompanying bone injury between the two groups, a statistically significant difference was detected between them ($p<0.05$) (Table 3).

Discussion

The study includes a comparative analysis of the patients who presented with traumatic hand injuries in our country, where partial quarantine is implemented during the COVID-19 pandemic, with the previous year. When evaluated economically in terms of both loss of job and treatment costs, hand injuries are significant and constitute 29% of the injuries in emergency departments [4].

In the literature, there are publications that have examined hand injuries during the COVID-19 pandemic before [5-7]. In these studies, it was highlighted that the etiology and management of hand injuries changed during the lockdown period.

In our study, it was concluded that the most common type of injury during lockdown occurred in occupational accidents involving glass incisions. However, no change was observed in the injury mechanism in the previous year. This situation may indicate that the working life and the intensity of work brought by industry and production did not change so much when compared to the period before the pandemic.

It has been demonstrated that orthopedic practice has also been affected during the COVID-19 pandemic [8]. It is assumed that reducing human mobility to lessen the spread of the virus will decrease trauma-related injuries. When evaluated in respect of hand injuries, the number of patients dropped compared to the previous year. However, no obvious decrease was felt even though the number of patients decreased. This situation may be attributed to the lack of a complete quarantine implementation in our country.

It has been reported that lockdown periods have led to changes in people's behavior and habits [9]. Even though it was thought that behavioural changes might influence hand injuries, there was no significant difference between the two groups in terms of injury mechanism.

In several parts of the world, different precautions have been taken by hand surgeons during the COVID-19 pandemic [7-10]. In many clinics, the number of beds and operating rooms has been decreased. The purpose of this action was to make room for COVID-19 patients [11]. Also, in our clinic, the number of beds has dropped from 40 to 20 during the pandemic period. However, as the study examined patients with hand injuries and patients exposed to trauma for both years, no problems were encountered regarding accommodation for patients with hand injuries. Meanwhile, it was observed that there was no significant difference in the length of hospitalization of the patients in both years.

In our study, patients who presented to the emergency department for hand injuries and their demographic analyses were examined. Hand injuries, which were admitted to the emergency department and did not require hospitalization were not included in the study. This enabled us to more clearly conduct a comparative analysis of both years.

Unlike other studies, refugee patients are also provided with a lot of health services because of the geographic location in which we live. When both groups were analyzed, a significant difference was identified between the ethnic origins of patients with hand injuries. This may show that during the lockdown period, refugees are either less exposed to hand injuries or cannot access health services as easily as others. On the other hand, the accompanying bone injuries were found to be significantly different between the two groups, and even the accompanying bone injuries were proportionally higher in the pandemic period. Even though it is predicted that the pandemic will reduce mobility in the streets and reduce high-energy traumas, our data exclude this prediction.

The study has some limitations. First, this is a retrospective study. This is a limitation. Besides, the patients were analyzed in line with the data obtained from the digital archive of the hospital. In such cases, though rare, a few things may be overlooked due to the problems in the recording system.

Conclusion

With the COVID-19 pandemic, it is observed that the mechanism of hand injuries, age, gender, length of hospitalization and the process do not change so much for our country. The pandemic period changes habits; however, we cannot determine how much hand injuries will be influenced unless there is a complete quarantine application.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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